

CLAIMS

1. A stream generation apparatus which generates a stream including coded pictures and a command for managing a buffer which holds a decoded picture as a reference picture, the command being added to one of the coded pictures, said apparatus comprising:

a judging unit operable to judge that whether or not the coded picture to which the command is added is to be skipped at the time of trick-play;

an adding unit operable to add, in the case where the coded picture is judged to be skipped, repetition information indicating the same contents as the command to another coded picture that follows, in decoding order, the coded picture judged to be skipped and that is not skipped at the time of the trick-play; and

a generating unit operable to generate the stream including the coded pictures, the command and the repetition information.

2. The stream generation apparatus according to Claim 1, wherein the command instructs to change an attribute of the reference picture stored in the buffer from a short term memory to a long term memory.

3. The stream generation apparatus according to Claim 1, wherein said judging unit is operable to judge that a reference B picture is skipped at the time of trick-play, in the case where the coded picture to which the command is added is the reference B picture that is to be referred to when another coded picture is decoded.

4. The stream generation apparatus according to Claim 3, wherein said adding unit is operable to add the repetition information to one of an I picture and a P picture which follows, in

decoding order, the coded picture judged to be skipped, the coded picture being a reference B picture.

5. The stream generation apparatus according to Claim 1,
5 wherein said judging unit is operable to judge that a P picture is skipped at the time of trick-play, in the case where the coded picture to which the command is added is the P picture that is to be skipped when a specific P picture is decoded, and

10 the specific P picture can be decoded by selectively decoding a preceding I picture or P picture in decoding order.

6. The stream generation apparatus according to Claim 5,
wherein said adding unit is operable to add the repetition information to the another picture that follows, in decoding order,
15 the P picture judged to be skipped and that is necessary for decoding the specific P picture.

7. The stream generation apparatus according to Claim 6,
wherein said judging unit is further operable to judge that a
20 reference B picture is to be skipped at the time of trick-play, in the case where the coded picture to which the command is added is the reference B picture.

8. The stream generation apparatus according to Claim 7,
25 wherein said adding unit is further operable to add the repetition information to one of an I picture and a P picture that follows, in decoding order, the reference B picture judged to be skipped.

30 9. A stream generation method for generating a stream including coded pictures and a command for managing a buffer which holds a decoded picture as a reference picture, the command

being added to one of the coded pictures that is used as a reference picture, said method comprising:

judging that whether or not the coded picture to which the command is added is to be skipped at the time of trick-play;

5 adding, in the case where the coded picture is judged to be skipped, repetition information indicating the same contents as the command to another coded picture that follows, in decoding order, the coded picture judged to be skipped and that is not skipped at the time of the trick-play; and

10 generating the stream including the coded pictures, the command and the repetition information.

10. A picture coding apparatus comprising:

a coding unit operable to code pictures;

15 a first adding unit operable to add a command for managing a buffer which holds a decoded picture as a reference picture to one of the coded pictures that is used as a reference picture;

20 a judging unit operable to judge that whether or not the coded picture to which the command is added is to be skipped at the time of trick-play;

an adding unit operable to add, in the case where the coded picture is judged to be skipped, repetition information indicating the same contents as the command to another coded picture that follows, in decoding order, the coded picture judged to be skipped and that is not skipped at the time of the trick-play, and

25 a generation unit operable to generate the stream including the coded pictures, the command and the repetition information.

11. A picture coding method, comprising:

30 coding pictures;

adding a command for managing a buffer which holds a decoded picture as a reference picture to one of the coded pictures

that is used as a reference picture;

judging that whether or not the coded picture to which the command is added is to be skipped at the time of trick-play;

adding, in the case where the coded picture is judged to be skipped, repetition information indicating the same contents as the command to another coded picture that follows, in decoding order, the coded picture judged to be skipped and that is not skipped at the time of the trick-play; and

generating the stream including the coded pictures, the command and the repetition information.

12. A computer readable recording medium in which a program is recorded, the program being for causing a computer to execute the stream generation method according to Claim 9.

13. A computer readable recording medium in which a program is recorded, the program being for causing a computer to execute the picture coding method according to Claim 11.

14. A program for causing a computer to execute the stream generation method according to Claim 9.

15. A program for causing a computer to execute the picture coding method according to Claim 11.

16. A stream which includes coded pictures,
wherein said stream includes a command and repetition information,

said command is a command for managing a buffer which holds a decoded picture as a reference picture, and is added to one of the coded pictures used as a reference picture, and

said repetition information has the same contents as the

command added to one of the coded pictures that is to be skipped at the time of trick-play, and is added to another coded picture which follows, in decoding order, the coded picture to be skipped and that is not skipped at the time of the trick-play.

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17. A computer readable recording medium in which the stream according to Claim 16 is recorded.

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18. An integrated circuit which generates a stream including coded pictures and a command for managing a buffer which holds a decoded picture as a reference picture, the command being added to one of the coded pictures, said integrated circuit comprising:

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a judging unit operable to judge that whether or not the coded picture to which the command is added is to be skipped at the time of trick-play;

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an adding unit operable to add, in the case where the coded picture is judged to be skipped, repetition information indicating the same contents as the command to another coded picture that follows, in decoding order, the coded picture judged to be skipped and that is not skipped at the time of the trick-play; and

a generating unit operable to generate the stream including the coded pictures, the command and the repetition information.